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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,964	06/30/2000	Kiwamu Takehisa	VX002160	1572
21369	7590	04/19/2004	EXAMINER	
VARNDELL & VARNDELL, PLLC 106-A S. COLUMBUS ST. ALEXANDRIA, VA 22314			DIAZ, JOSE R	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 04/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/608,964	<b>Applicant(s)</b> TAKEHISA ET AL.	
	<b>Examiner</b> José R Díaz	<b>Art Unit</b> 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 8 and 11 are still rejected under 35 U.S.C. 102(e) as being anticipated by Basting et al. (US Pat. No. 6,154,470).

Regarding claim 8, Basting et al. teaches a fluorine laser (see abstract) comprising a laser chamber (2) which is filled with a laser gas including fluorine (F<sub>2</sub>) (see figs. 2a, 2b, 8a, 8b, 9a, and 9b) and to which a predetermined discharge voltage is applied between a cathode and an anode (3a, 3b) thereof for causing a fluorine laser to oscillate laser light (LASER OUTPUT BEAM) to be supplied as an exposure light source of an exposure apparatus (see figs. 2a, 2b, 8a, 8b, 9a, and 9b), wherein total pressure of said laser gas is set equal to or lower than 2.8 atm (see col. 2, lines 30-34 and col. 8, lines 54-57) such that a bandwidth (linewidth) of laser light oscillated by said laser chamber is narrowed to a desired value (see col. 6, lines 8-10).

Regarding claim 11, Basting et al. teaches that the interval between the cathode and anode (3a, 3b) is set at a predetermined length to maintain glow discharge without

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causing dielectric breakdown between said cathode and anode when total pressure of said laser gas is set equal to or lower than 2.8 atm (see col. 3, lines 48-50 and col. 4, lines 28-24).

Claims 8 is still rejected under 35 U.S.C. 102(e) as being anticipated by Szatmári (US Pat. No. 5,303,254).

Regarding claim 8, Szatmári teaches a fluorine laser (see col. 6, lines 37-39) comprising a laser chamber (see Figs. 2 and 5) which is filled with a laser gas including fluorine (see col. 6, lines 37-39) and to which a predetermined discharge voltage is applied between a cathode and an anode ("two elongated electrodes") thereof for causing a fluorine laser to oscillate laser light (see col. 6, lines 27-27 and 41-47) to be supplied as an exposure light source of an exposure apparatus (see fig. 2), wherein total pressure of said laser gas is set equal to or lower than 2.8 atm ("total pressure of 2.6 bar") (see col. 8, lines 46-47) such that a bandwidth of laser light oscillated by said laser chamber is narrowed to a desired value (see col. 6, lines 8-10).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 8-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nozue et al. (US Pat. No. 4,856,018) in view of Wakabayashi et al. (US Pat. No. 5,642,374).

Regarding claim 8, Nozue et al. teaches a well known excimer laser (see Fig. 11) comprising a laser chamber (10) which is filled with a laser gas including fluorine (see col. 1, lines 15 and 19-21 and col. 2, lines 12-16) and to which a predetermined discharge voltage is applied between a cathode and an anode (16) thereof for causing a fluorine laser to oscillate laser light (see col. 1, lines 15 and 19-21 and col. 2, lines 12-16) to be supplied as an exposure light source of an exposure apparatus (see fig. 11). However, Nozue et al. fails to teach the limitation of controlling the total pressure of said laser gas to about 2.8 atm or lower such that a bandwidth of laser light oscillated by said laser chamber is narrowed to a desired value. Wakabayashi et al. teaches that it is well known in the art to include a gas control means for controlling composition or total pressure of the prescribed types of laser gases in such a way that the beam profile is

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shaped as desired (see col. 3, lines 30-35). Nozue et al. and Wakabayashi et al. are analogous art because they are from field of endeavor as applicant's invention. At the time of the invention it would have been obvious to a person of ordinary skill in the art to include a gas control means for controlling composition or total pressure of the prescribed types of laser gases in such a way that the beam profile is shaped as desired. The motivation for doing so, as is taught by Wakabayashi et al., is controlling the beam profile to the desired shape by adjusting the gas amount (col. 3, lines 35-40). Therefore, it would have been obvious to combine Nozue et al. with Wakabayashi et al. to obtain the invention of claim 8.

With regards to the specific pressure range claimed by applicant, Wakabayashi et al. provides the general teaching of controlling the total pressure of the laser gases in such a way that the beam profile is shaped as desired. It would have been obvious to one of ordinary skill in the art to control the total pressure of the laser gas to about 2.8 atm or lower, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Huang*, 40 USPQ2d 1685,1688(Fed. Cir. 1996) citing *In re Aller*, 105 USPQ 233., 235 (CCPA 1955).

Regarding claim 9, Nozue et al. and Wakabayashi et al., as stated before, teaches the claimed fluorine laser (see rejection of claim 8, above). In addition, Nozue et al. further teaches the limitation that the bandwidth of laser light oscillated by said laser chamber (10) is narrowed to a desired value without use of an optical element to

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further narrowing said bandwidth of laser light (see fig. 11, wherein the output beam of the laser chamber (10) is directed to the amplifier 20 by the mirrors 17 and 18).

Regarding claims 10, 15 and 16, Nozue et al. fails to teach the limitation of controlling the total pressure of said laser gas to about 1 atm or lower such that a bandwidth of laser light oscillated by said laser chamber is narrowed to a desired value. Wakabayashi et al. teaches that it is well known in the art to include a gas control means for controlling composition or total pressure of the prescribed types of laser gases in such a way that the beam profile is shaped as desired (see col. 3, lines 30-35). Nozue et al. and Wakabayashi et al. are analogous art because they are from field of endeavor as applicant's invention. At the time of the invention it would have been obvious to a person of ordinary skill in the art to include a gas control means for controlling composition or total pressure of the prescribed types of laser gases in such a way that the beam profile is shaped as desired. The motivation for doing so, as is taught by Wakabayashi et al., is controlling the beam profile to the desired shape by adjusting the gas amount (col. 3, lines 35-40). Therefore, it would have been obvious to combine Nozue et al. with Wakabayashi et al. to obtain the invention of claim 10.

With regards to the specific pressure and bandwidth ranges claimed by applicant, Wakabayashi et al. provides the general teaching of controlling the total pressure of the laser gases in such a way that the beam profile is shaped as desired. It would have been obvious to one of ordinary skill in the art to control the total pressure of the laser gas to about 1 atm or lower such that the beam profile is shaped as desired (e.g. a beam having a bandwidth not exceeding 0.6 pm), since it has been held that where the

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general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Huang*, 40 USPQ2d 1685,1688(Fed. Cir. 1996) citing *In re Aller*, 105 USPQ 233., 235 (CCPA 1955).

Regarding claim 11, Nozue et al. teaches that the interval between the cathode and anode (16) is set at a predetermined length to maintain glow discharge (see Fig. 11). With regards to the total gas pressure, please see the rejection of claim 8 above.

Regarding claim 12, Nozue et al. teaches that the discharge mode for causing said glow discharge (see area between electrodes 16) is longitudinal discharge (please note that in a 2D view the glow or plasma discharge is defined by two axis: longitudinal axis (x) and the transverse or vertical axis (y) ) in which discharge occurs in the same direction as an optical axis of laser light oscillated in said laser chamber (10) (see fig. 11).

Regarding claim 13, Nozue et al. teaches that the laser apparatus further comprises an oscillator (10) and an amplifier (20) (see Fig. 11).

Regarding claim 14, Nozue et al. teaches that the discharge mode for causing said glow discharge (see area between electrodes 16) is transverse discharge in which discharge occurs in a direction perpendicular to an optical axis of laser light oscillated in said laser chamber (10) (see fig. 11).

### ***Response to Arguments***

Applicant's arguments filed January 5, 2004 have been fully considered but they are not persuasive.



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The examiner thanks applicant for pointing out to the examiner the typographical errors included in the last Office Action. Specifically, claim 9, which was unintentionally included in the rejection based on Szatmári instead of Basting et al. Corrected action was done by the examiner to address this matter.

With regards to arguments against Basting et al., Applicant argued that Basting et al. fails to teach the claimed invention since Basting et al. uses etalons for narrowing the bandwidth of the laser light (page 8, lines 1-5 in Applicant's remarks). However, it is noted that nowhere in claim 8, the recited invention is limited as argued. Thus, the rejection over Basting et al. is considered to be proper.

With regards to Szatmári, it is noted that the invention recited in claim 8 is not limited to only molecular  $F_2$ . As a matter of fact, claim 8 only required the present of fluorine in the laser gas, which Szatmári teaches in column 6, lines 37-39: "The discharge vessel 18 contains suitable laser gas, for example a mixture of...fluorine..."

In addition and with regards to the arguments about the amplifier device, it is noted that Szatmári does not limit the invention to only an amplifier configuration. As a matter of fact, the disclosed device can also be used as an oscillator (see figure 2 and col. 7, lines 18-19), which is the device that applicant used to narrow the beam width of the laser light (see "OSCILLATOR" 11 in figure 1 of the specification). Thus, the rejection over Szatmári is considered to be proper.

With regards to Nozue and Wakabayashi, it is noted that although Nozue et al. uses a dispersion prism 13 to select a particular wavelength of the laser light, Wakabayashi teaches a configuration in which such dispersion prism 13 is not needed

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(see laser chamber 4 in figure 1). In addition, Wakabayashi does teach the limitation about narrowing the beam width by controlling the total pressure of the laser gas in column 16, lines 65-67: "...controlling the beam width by adjusting...total pressure of the laser [gases]". Thus, the rejection is considered to be proper.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

### ***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (571) 272-1727. The examiner can normally be reached on 9:00-5:00 Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JRD  
4/15/04

  
JEROME JACKSON  
PRIMARY EXAMINER